

THE GENERAL BOARD

United States Forces, European Theater

ORDNANCE CLASS II AND IV SUPPLY
IN EUROPEAN THEATER OF OPERATIONS

MISSION: Prepare Report and Recommendations on Ordnance Class II and IV
Supply in European Theater of Operations.

The General Board was established by General Orders 12C, Headquarters European Theater of Operations, US Army, dated 17 June 1945, as amended by General Orders 182, dated 7 August 1945 and General Orders 312 dated 20 November 1945, Headquarters United States Forces, European Theater, to prepare a factual analysis of the strategy, tactics and administration employed by the United States forces in the European Theater.

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3. Inter-Office Memo Slip, Headquarters, Fifteenth US Army, dated 19 May 1945, from Armored Section, Fifteenth US Army to Ordnance Section, Fifteenth US Army, subject: "Statistics, Medium Tanks in Combat, Experience of First US Army."
4. Extract from 12 US Army Group G-4 Periodic Report covering period from 240001 December 1944 to 302400 December 1944. Report dated 021200 January 1945.
5. Statement of Lieutenant Colonel M. L. Driscoll, Ordnance Supply Officer, Ordnance Service, 808-MTO and Communications Zone, ETOUSA, from June 1942 to April 1945.

R E S T R I C T E D

THE GENERAL BOARD
UNITED STATES FORCES, EUROPEAN THEATER
APO 408

ORDNANCE CLASS II AND IV SUPPLY
IN EUROPEAN THEATER OF OPERATIONS

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R E S T R I C T E D

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CHAPTER 1

RESPONSIBILITY FOR SUPPLY

SECTION 1

DIRECTIVE TO SUPREME COMMANDER

ALLIED EXPEDITIONARY FORCE

1. Supply Responsibility. Responsibility for logistical support of British forces participating in cross-channel operations rested with British Service Ministries. Support of United States forces rested with the United States War and Navy Departments.¹

2. Current War Department Policy.

a. Overseas supply was divided into three phases:²

- (1) First Phase - Automatic supply until such time as normal supply procedure could be put into operation.
- (2) Second Phase - Semi-automatic supply based on the edited Materiel Status Report.
- (3) Third Phase - Supply on a requisition basis, after authorized levels of supply have become stabilized.

b. Levels of supply were to be established by the War Department, who would also keep Army Service Forces informed of the troop basis.

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CHAPTER 2

SUPPLY BUILD-UP

SECTION 1

THE PERIOD BEFORE "OVERLORD"

(February 1942 to August 1943)

3. Logistical Situation. Operation "Torch" was mounted in October of 1942, and thereafter ground forces in the United Kingdom remained at a small figure until the build-up for operation "Overlord" commenced in the fall of 1943. This small force and the higher priority of other theaters of operations provided for no extensive build-up in initial theater stocks during the first or automatic supply phase.

4. Level of Supply. The level of supply for Ordnance Class II and IV supplies was fixed at 60 days of supply in November 1942,¹ and was subsequently reduced to 45 days of supply in June 1943.² In January 1944, the level of supply was raised to 75 days of supply and an operating reserve of 30 days was authorized.³

5. War Department Replacement Factors. War Department replacement factors in use during the pre-invasion build-up were adequate except in the case of medium tanks. However, the prescribed level of supply times the War Department replacement factor determines the quantity of major items of equipment that constitute the theater reserve. A comparison of War Department replacement factors in effect during the supply build-up and those arrived at towards the end of the European Campaign is shown in Appendix I. Average monthly battle losses of equipment and replacement factors recommended by First US Army prior to the invasion are also shown.⁴

SECTION 2

SUPPLY BUILD-UP FOR "OVERLORD"

6. Initiation of Build-Up. Upon approval of the "Overlord Appreciation and Outline Plan" by the combined Chiefs of Staff in August 1943, accelerated supply was initiated. At this time, one infantry division and supporting service troops, fully equipped, were in the United Kingdom. The troop build-up for operation "Overlord" was anticipated by advance of pre-scheduled shipments of major items contained in current tables of equipment for the troop units to be shipped. During the period from 1 June 1943 to 31 May 1944, Ordnance Class II and IV supply comprised 40% of the total United States cargo received in the United Kingdom.⁵

7. Basis for Determining the Requirement. The requirement for major items included both major items to complete tables of equipment authorizations and the prescribed reserve. The reserve was computed at current War Department replacement factors for the number of major items shipped to the theater, limited by the prescribed level of supply. The requirement for spare parts was based on the addendum to the Ordnance Catalog, which establishes the rate at which parts are expected to be consumed in maintenance during the first year and for major overhaul.

8. Supply Responsibilities. The supply of newly arrived units was a responsibility of Services of Supply, European Theater. Each unit arriving in the United Kingdom was advised from which point it was to draw Ordnance Class II and IV Supplies. Major items were issued to new units in

accordance with the plan of pre-scheduled shipments of unit equipment. After the initial automatic issue, any shortages still remaining were obtained by requisition.⁶ Upon arrival of a troop unit, the Ordnance Officer of the major command was furnished a statement of the availability of unit equipment, including predicted dates of availability of items not currently on hand. Under this system, an American division was considered available for employment 30 days after its arrival in the United Kingdom.⁷ The system of pre-scheduled shipments was followed throughout the build-up except in the case of certain major caliber artillery units where the overall shortages of material required shipment of the unit and its equipment convey loaded.⁸ (Appendix 5)

9. Changes in Policy on Spare Parts. Army Service Forces, on 12 January 1944, directed the concurrent shipment, to accompany major items, of spare parts required for six months field maintenance and major overhaul. This policy was amended on 10 February 1944, directing shipment of one-half of the maintenance spare parts initially procured with the major item in lieu of six months field maintenance and major overhaul requirement. A further amendment on 21 February 1944 reduced the spare parts shipped with the major item to 75 days of supply, the level of supply then established for the European Theater. Under this new directive, new items of equipment and items increasing the major item density of the theater were to be accompanied with maintenance spare parts equivalent to 75 days of supply, based upon the maintenance rate shown in the addendum of the appropriate Ordnance catalog.⁹ War aid, Navy and Marine Corps shipments continued to be accompanied by the full 12 months requirement of spare parts for maintenance and major overhaul.¹⁰

10. Difficulties Encountered in Spare Parts. Apart from the changes in policy announced four months after the plan of operations had been published and less than six months before the target date of the operation, many other difficulties were encountered. The stock level of 75 days was not a realistic approach to the actual minimum time elements for a typical replenishment stock requisition. Under the most favorable conditions, a replenishment stock requisition required 131 days and frequently exceeded this figure by from 30 to 60 days.¹⁰ Obviously this deficiency was increased by sinkings and misdirection of shipments. Although spare parts were shipped to accompany new items and items that increased item density, replenishment of stock to maintain items already on hand; to maintain the new items and increased item density; and to provide the operating reserve was on a requisition basis. Ordnance maintenance and tactical depot companies were received without basic loads rendering many of these later phased units ineffective for an unduly long period of time since the supplies were dissipated to equip earlier arrivals.¹¹ These units were furnished basic loads, so far as this was possible, and basic loads and organizational spare parts and equipment were issued to using arms, further diminishing stocks and removing stock from control of the Chief Ordnance Officer. An additional limiting factor arose from the requirement that 45 days of supply be emphatically packed for use on the continent, thereby immobilizing additional stocks. The magnitude of the build-up from practically no ground forces to the large armies of the pre-invasion forces pyramided requirements, especially since the authorized level of supply was far below the actual minimum time elements for a typical replenishment stock requisition. The progressive reduction of army requirements resulted from inadequate production to meet commitments for War Aid and other services.¹⁰ Computation of spare parts at addendum rates resulted in an excess of slow-moving parts and a dearth of fast-moving parts. The initial stockage was deficient and the lack of fast-moving parts was thus intensified by the necessity for distributing stocks among a large number of maintenance and tactical depot companies resulting in depletion of theater reserves.

11. Obtaining Basic Loads. Both First and Third US Armies found

it necessary and desirable to supervise and assist maintenance and field depot companies in preparing their requisitions for basic loads. First US Army revised addendum rates to include the experience obtained in other theaters and circulated this information to assist units in preparing their requisitions. Units were furnished a weapons list on which to base their computations. Beach-packs containing parts consumed at a rapid rate were obtained and issued to units to augment supplies expected to be consumed in the first few days.¹² Third US Army prepared requisition forms for each standard nomenclature list sub-group to be used by maintenance and field depot companies in obtaining basic loads. These prepared requisitions reduced materially the man hours required to prepare basic load requisitions. Standard numbers and better information on interchangeability was also effected as a result of this effort by the army.¹¹

12. Accounting. A plan was devised by Third US Army to require all units to include in the Unit Morning Report, once a week, the quantity of major items on hand in the unit. This plan had been used successfully in another theater, where it resulted in accurate information of the status of major items being made available to the army Ordnance Officer periodically on a roster prepared by the machine records unit. This plan was not approved by the Army Adjutant General, and was not put into effect.

SECTION 3

CROSS-CHANNEL OPERATIONS

13. First US Army. First US Army Ordnance Service, assisted by several thousand reinforcements trained as drivers, embarked for the continent with a 45 day supply of Ordnance major items. Non-rolling major items were distributed among maintenance companies and 3,000 rolling major items driven by reinforcements were attached to Ordnance companies for the movement.¹² In addition, the army carried approximately 11,000 tons of Ordnance Class II and IV supplies, exclusive of major items. All rolling major items of the reserve, together with organic transport of Ordnance units including tank transporters and wreckers, were used as cargo carriers. Reserve tanks carried an extra set of tracks wrapped around the turret, and all other reserve vehicles including one-quarter ton trucks and half-tracks were loaded to their maximum capacity with supplies. This arrangement eliminated the need for additional lift and for handling in beach dumps.

14. Third US Army. The Third US Army could not be provided with reserves of Ordnance major items. It was possible, however, to assemble approximately 30 days of Ordnance Class II and IV supplies, exclusive of major items, which was carried by Ordnance units of the army on organic transport.¹³

15. Pre-Invasion Difficulties. Considerable difficulty was encountered in processing requisitions due to the system of coding unit designations which was necessary to insure security of the operation. Many requisitions were lost or misdirected due to this requirement. Requisitions might bear any one of 1500 unit shipment numbers or coded unit designations, practically defeating all efforts at identification by the liaison parties established by the armies to pick up and forward requisitions to units in the marshalling areas. This resulted in many units embarking for the continent with outstanding requisitions.

16. Continuity of Supply. First US Army prepared and submitted four phased requisitions, containing items of supply most apt to be needed in the interval between D-Day and the time when regular requisitioning procedures and re-supply would be established by Communications Zone.¹²

First and Third US Armies retained liaison personnel in the United Kingdom to follow up on commitments and to insure continuity of supply on outstanding requisitions.^{11, 12}

17. Maldistribution of Supplies. First US Army, by reason of its priority as the force designated to secure the initial beachhead and because the Third US Army would not become operational until after the beachhead was secured, was able to obtain its requirements. These requirements, together with special authorizations for amphibious operations and communications which were approved by the War Department for issue from the theater reserve, so drained the reserve of major items that it was impossible to meet the requirements of the Third US Army for an operating reserve until after the campaign of Northern France.¹³

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CHAPTER 3

OPERATIONS ON THE CONTINENT

SECTION 1

MAJOR ITEMS

18. Completion of Requirements. During the initial stages of the European Campaign, Third US Army and Advance Section, Communications Zone, had no reserve of major items. By 8 August 1944, Third US Army had completed its equipment, but it was not until the end of October that battle losses were overtaken and an adequate reserve established. Ninth US Army became operational in October 1944, but the critical status of major items precluded establishing a satisfactory reserve for that army until 9 December 1944. Allocations of major items in critical short supply between the armies was controlled by 12 Army Group.¹ 6 Army Group was supplied initially by the North African Theater of Operations. Lines of communications from Marseilles were long and weather conditions during January interfered with movement of supplies of all classes. Some help was received from Communications Zone, but the heavy losses sustained by 12 Army Group in December eliminated that source of supply for a time. Reserves consistent with operational requirements were maintained by authorizing withdrawals from army and separate forces of whatever percentage of equipment was necessary.²

19. Battle Losses. Losses of major items during the first 39 weeks of the European Campaign exceeded anticipated requirements and available re-supply. The number of weeks certain critical items were reported as being in critical short supply during this period is shown in Appendix 2.⁴ Action was taken by First US Army to reduce the number of medium tanks in all units of that army to approximately 95% of that authorized by tables of equipment. Of this reduced authorization, only 88% was operable on an average day (Appendix 3).⁵ Battle losses of equipment vary for many reasons and are difficult to predict. However, supply levels must be sufficiently large to promptly replace losses due to unexpected types of operations or to a successful enemy action. The stubborn defense of hedgerows in the Normandy Campaign placed a premium on 60mm mortars, automatic rifles and medium tanks. Reserves were exhausted and tables of equipment levels could not be maintained.⁶ The operation of the Red Bull Highway across western France rapidly exhausted reserves of general purpose vehicles. An example of the magnitude of a loss due to successful enemy action is shown in Appendix 4 which lists 12 Army Group battle losses during the Ardennes Campaign.⁷ By 1 March 1945, the desired reserves of major items were available to all armies and no major item was in critical short supply thereafter.⁴

SECTION 2

SPARE PARTS

20. Depletion of Basic Loads. Combat units were phased in more rapidly than planned. First US Army at the end of July 1944 was supporting 19 divisions instead of the 12 planned for.⁸ Basic loads of this army were depleted of fast moving parts. Third US Army's basic load did not reach an appreciable operating level until 4 September 1944.⁶ Ninth US Army was not brought to a substantial operating level until 1 March 1945.^{1, 9} By this latter date, Ordnance Class II and IV supply could be termed satisfactory.

21. Cleaning and Preserving Materials. Tables of allowances for cleaning and preserving materials do not provide for the issue of mater-

tools listed in SNL K-1 in a manner to permit using arms to carry out the provisions of current technical manuals relative to care of armament and fire control instruments. Serious shortage, inequitable distribution and waste of cleaning and preserving materials were normal and resulted from bulk packaging of these supplies. Rifle bore cleaner was not available to armored and artillery units. Camel hair brushes, lens tissue, soft cloth and liquid soap likewise were not available. Flannel patches were wasted because bulky packages became wet and dirty before they could be used.³

22. Class IV Supply. Ordnance Class IV supply is generally considered to be of a minor nature and supplies are placed in Class IV with reluctance. The obvious advantage of the emphasis placed on supplies for special operational needs is thus lost. Prestone was in critical short supply long after the date when freezing weather might have been expected.^{6, 10} Parts for Landing Vehicle Track; Truck, 2½-ton, 6x6, Amphibian; and Cargo Carriers M29 were always critical although these are vehicles useful only for special operational purposes. This was realized during the winter operations across the Roer and Rhine Rivers and those directed at the Roer Dams when operational pools of these vehicles were set up for special needs of units engaged. The same comment applies to the Red Ball Highway where, as has already been stated, an unexpected demand exhausted theater reserves of vehicles and also depleted theater stocks of tires, tubes, engines, axles and other major assemblies for general purpose vehicles.⁶

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10. After Action Report, Third US Army.

ACCOUNTING AND ADMINISTRATION

SECTION 1

SUPPLY ADMINISTRATION

23. Major Items.

a. Armies were allocated major items on the basis of bi-monthly Status of Materiel Reports and weekly reports of battle losses submitted to the Ordnance officer, Communications Zone.¹ As materiel became available in Communications Zone, shipping orders for non-critical items were written to replace deficiencies in the armies. Shipping orders on critical items were written in accordance with the desires of the army group, whose chief administrative function became the distribution of critical supplies among the armies to further tactical plans. All items on hand in the army, whether serviceable or in shops, were charged against the army whose holdings were limited to authorized tables of equipment plus special authorizations and reserve at current War Department replacement rates. In the case of medium tanks, the percentage in shops often exceeded the authorized reserve, hence tank units were generally below authorized tank strength.

b. Major items of equipment arriving in the army area were received in the main army vehicle and artillery park where they were processed and made ready for issue. In three armies, control over the issue of major items was retained by the army Ordnance Officer and replacement was obtained by allocation from the army. Two armies decentralized this control to operating Ordnance group headquarters, requiring them to issue replacement major items, although critical items were more rigidly controlled, from time to time, to further tactical plans.

c. Ordnance major items for Air Force units were issued in bulk by the Communications Zone and were then distributed through four Air Force depots.

24. Spare Parts. All armies obtained spare parts on requisition submitted bi-monthly to designated Communications Zone depots. In addition, "Immediate Action" requisitions required to remove items from deadline were submitted to Advance Section or Continental Advance Section depots as the need occurred. Spare parts were received in the army area by the main army wholesale depot and distributed to forward and intermediate retail depots who filled requisitions of Ordnance units only. Using arms received Ordnance supplies through the supporting Ordnance companies.

25. Requisition Procedure.

a. Normal requisitioning procedure was used in all echelons throughout the European Campaign; however, the identifying parts number system caused confusion. Item stock number, federal stock number, piece mark or drawing number and manufacturer's number were all in general use. Many publications for supply in use did not contain all of the above numbers and moreover faulty distribution of publications did not insure that Ordnance companies had the correct publication at all times. A survey conducted by the Ordnance officer, Communications Zone, revealed that 5% of the parts not issued against requisitions was due to improper application of parts numbers.¹ The use of cross reference lists of Ordnance part and stock numbers "Ord 15-1 and 15-2" was initiated during

the campaign, but full benefit was not realized because these publications arrived too late and distribution to Ordnance units was incomplete.

b. The Air Forces requisitioned spare parts in bulk from the Communications Zone depots and the supplies were redistributed through the four advance Air Force depots on the continent.

SECTION 2

ACCOUNTING

26. Stock Cards. A shortage of stock cards and the lack of a uniform card on which to record all essential information caused difficulty in all echelons of Ordnance supply. A lack of sound and uniform training of supply personnel was evidenced by their inability to determine interchangeability of parts and to keep proper records of interchangeability on stock cards. This universal fault reduced the efficiency of Ordnance service. Interviews with many experienced Ordnance officers in all echelons of Ordnance service indicate a need for a pre-printed stock record card for each part contained in the higher echelon spare parts and equipment and organizational spare parts and equipment lists. In the opinion of these officers such a card, able to withstand field use and containing space for all essential data, would greatly improve Ordnance service and save time and labor in training Ordnance supply personnel. Disadvantages of current forms of stock cards are:

- a. The Kardex System, although convenient and portable, lacks space for posting "Dues Out" and interchangeability information.
- b. WD AGO Forms 421, 423, and 424 provide sufficient space, but are not sufficiently durable for field use.
- c. WD OO Form 7211 is large and has ample space but will not withstand field use and is too large for use in vans.

27. Back Orders. All armies as well as Communications Zone depots emphasized a "Dues Out" or back-order system, with a provision that orders would not be cancelled without approval of the ordering agency. Faulty documentation of shipments made it extremely difficult to reconcile receipts of stock with orders. Because of this, inexperienced supply personnel permitted back-orders to pyramid. When it became evident that the system had lost all semblance of control, periodic reviews were initiated and these reviews demonstrated that the distorted picture was due to several causes, such as:

- a. Improper nomenclature.
- b. Incorrect part numbers.
- c. Transfer of units between armies.
- d. Substitution of new types of equipment.
- e. Failure to cancel requirements due to weather and type of operation.
- f. Engineering improvements in the major item.

Air Force depots used a similar system of "Dues Out". A lack of trained Ordnance supply personnel in the Air Force prevented timely review of outstanding "Dues Out" and resulted in a tendency to fill new requisitions without regard for "Dues Out". A survey conducted by the First US Army revealed that approximately 10% of outstanding back orders accumulated during the first six months of the campaign were void for the reasons stated above.

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LOCAL PROCUREMENT

SECTION 1

LOCAL PROCUREMENT IN THE UNITED KINGDOM

28. Reciprocal Aid. Reciprocal aid was obtained under Lend-Lease agreements through the activities of the General Purchasing Board, European Theater of Operations. The office of the General Purchasing Agent, (Chairman of the General Purchasing Board) served as an administrative headquarters for general purchasing activities and established principles, policies, procedures (including contracts), standardization of procurement, and price control.

29. Demands were placed on the British Ministry of Supply by the armed forces of the United States during the build-up period in the United Kingdom. The General Purchasing Agent performed liaison between the American forces and the British Ministries. Full cooperation from an efficiently operating British system made local purchases simple. Vehicle waterproofing materials were procured for the American invasion forces based upon waterproofing 75 percent of all vehicles. This included 25,000 combat vehicles. In addition, training materials were procured on a basis of 25 percent of the vehicular strength in units to be waterproofed. All sheet metal, bar stock, welding rod, oxygen and acetylene were procured. Reciprocal aid received from Great Britain in the form of procurement for American forces was deducted from long range requisitioning from the Zone of the Interior.¹

SECTION 2

LOCAL PROCUREMENT ON THE CONTINENT

30. Reason for Need. Experience indicates that the addendum to the Ordnance catalog does not accurately reflect the rate at which parts will be consumed. It is prepared concurrently with the standardization of the major item and is therefore only a prediction of consumption rates. Consequently, the requirements of Ordnance field service will always vary from the actual scale at which parts are procured and issued. As requirements of field service are determined, production is varied to meet the need and the addendum is revised; however, the change is not felt in the field for many months. Frequently, substitute parts may be procured locally either by direct purchase off the shelf, by local manufacture, or by modification of other parts or of captured material.

31. Opportunities in Europe. Eastern France and Belgium afforded excellent manufacturing facilities which were exploited in various ways. Facilities included heavy industry capable of manufacturing artillery parts and complete mortars, an internationally famous arsenal capable of producing a volume of small arms parts and prepared to repair thousands of weapons, a number of engine repair facilities, an artillery recoil repair arsenal, a tire factory capable of new production as well as repair and re-tread, small automotive jobbers with stocks of parts, battery manufactories, battery repair shops and a multitude of similar installations. Due to the disorganized civilian economy, difficulty from the lack of power hampered these efforts, but many thousands of guns, tanks and trucks were kept in operation that would otherwise have been dead-lined.

32. Organization. The organization of the General Purchasing Board provided for a chairman who was also the General Purchasing Agent, and General Purchasing Regional Teams consisting of two officers and two or three enlisted men to be assigned to the Advance Section, Communications Zone; provision was also made for appointing branch purchasing and contracting officers in base sections of Communications Zone and in army, corps and division headquarters.²

33. Limitations. Monetary limitations were fixed on cash purchases or contracts executed by various headquarters as recommended by the General Purchasing Agent. The method of procurement by cash purchases was replaced by procurement by requisition as soon as agreements for mutual aid were reached between the Allied Expeditionary Forces and the liberated governments. After this procedure was established, cash purchases were restricted to \$100 except in emergencies and in Germany, where the limit was \$20.²

34. General Purchasing Teams. In France, from June to October 1944, the General Purchasing Teams spent much time locating and inventorying captured enemy dumps, and in performing local shopping service for miscellaneous units. By December 1944, their activities were directed toward purchasing and production. The office of the General Purchasing Agent in the Advance Section, Communications Zone, became a shopping information center for army, division and separate unit purchasing and contracting officers. Although one General Purchasing Team was assisting the G-4 of Third US Army in October 1944, it was not until April 1945 that teams were working with three of the four armies in a plan to reduce irregular methods of procurement and to provide a source of information on the location of raw materials and usable stocks in army zones.³

35. Difficulties in Long Range Procurement. Many difficulties were encountered in long range procurement. Coal was critically short and also mine labor. This necessitated priorities which were set up by G-4, Advance Section. Agreements had to be arrived at between Advance Section, SHAEF Solid Fuels sub-section and the Belgium Coal Syndicate in order to meet the coal situation and production was delayed. The ineffectual system established by the liberated governments for the processing and payment of requisitions to civilians weakened the procurement effort. Lack of communications between the national governments and the local burgomeisters caused delay.³ However, the long range procurement program of the Advance Section, Communications Zone, was producing many critical items on a weekly production schedule by the middle of January 1945.

36. Purpose of Procurement. Local procurement proved to be a timely and expeditious means for supplementing Ordnance supply.

37. Scope. Local procurement provided a means for exploiting local resources and enabled supply agencies to meet deficiencies and reduce dead-lines. Procedures permitted procurement of substitute items either by direct purchase, manufacture or by modification of existing or captured stocks. Procurement was restricted to items necessary for and ordinarily used in the military service.⁴

38. Responsibility. The formulation of procedures for local procurement by United States forces and the supervision and coordination of all procurement was the responsibility of the General Purchasing Board, European Theater of Operations, with the General Purchasing agent as Chairman thereof.

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1. Remarks of Lt. Col. M. L. Driscoll, Ordnance Supply Officer, Ordnance Service, SOS- ETO. (Appendix No. 5)
2. ETO-SOP No. 10, Procurement Regulations in Occupied and Liberated Territories.
3. Weekly Reports of GPA Activities, Advance Section, Communications Zone.
4. ETO-SOP's 10-B (Belgium), 10-F (France), 10-N (Netherlands), 10-L (Luxembourg)

CONCLUSIONS AND RECOMMENDATIONS

SECTION 1

CONCLUSIONS

39. Pre-Scheduled Shipments. Advance or pre-scheduled shipment of major items of equipment to an established Theater of Operations proved to be a satisfactory method. Units were expeditiously equipped and available for employment at an early date.

40. Initial Theater Reserves. Adequate build up of initial theater reserves during the first or automatic supply phase was not possible due to the small number of troops present in the United Kingdom, low priority and other reasons. The reserves provided were approximately 50% of the stockage required to give proper support to troops and to permit other operations in anticipation of large troop concentrations.

41. Theater Reserves. War Department Replacement Factors for reserve major items were adequate except in the case of medium tanks. The theater level of supply, however, was too low to meet contingencies resulting from temporary high battle losses; to permit maintenance exchange for unserviceable materiel; and to meet unexpected demands caused by special operations or a retrograde movement. Decreased unloading of ships and difficulties of inland transportation prevented major items in continental waters from being made available to the armies. A 30 day supply of reserve major items in the armies, when not backed up by adequate holdings in conveniently located Communications Zone depots, was inadequate to support operations. The authorized army reserve is adequate and should not be increased. The remedy for the problem lies in adequate Communications Zone support.

42. Theater Stocks of Spare Parts. The authorized level of supply was less than the re-order time. The automatic shipment of 75 days of supply of spare parts concurrently with major items of equipment did not provide sufficient spare parts to maintain equipment until stocks could be replenished. Computation of spare parts at addendum rates resulted in an excess of slow-moving parts and a dearth of fast-moving parts. Where the initial stock level was deficient, the lack of fast-moving parts was intensified and the necessity for distributing stocks among a large number of maintenance, field depot companies and units of the using arms resulted in immediate depletion of theater stocks. It is concluded that initial theater stocks should be computed on the basis of the first year's concurrent spare parts plus major overhaul.

43. Cleaning and Preserving Materials. Lack of up-to-date Tables of Allowances for the issue of cleaning and preserving materials, properly coordinated with current methods for care of armament and fire control instruments, as published in current technical bulletins, created an unsatisfactory supply situation. Bulk packaging contributed to maldistribution and wastage. Cleaning and preserving materials are of little use unless they reach the ultimate consumer, i.e., individual rifle-man, tank or artillery crew.

44. Requirements for Special Operational Needs. Major items and other supplies required for special operational needs or conditions of weather should be determined in advance, insofar as practicable by the appropriate Ordnance staff officer, and these should then be placed in Class IV Supply. Such requirements, being over and above current operating supplies, should then be forwarded to the major responsible supply

agency and a decision made at the appropriate level as to whether the requirements will seriously deplete normal operating stocks and if this be the case, increased supply or production must be requested. In the meantime, the risk of depleting current operating stocks can be evaluated and a rationing basis announced to avoid a complete shutdown of supply.

45. Supply Administration. There was a definite lack of training in supply administration. There is need for a uniform parts numbering system and proper training of personnel in its use. Requisitions prepared at the army level based on experience in previous operations were of real value; this practice facilitated ordering of basic loads and resulted in improved Ordnance service. The need for pre-printed stock cards was realized. These cards should contain full information as to: correct nomenclature, item stock number, interchangeability, supply factor, note symbol to indicate echelons of maintenance, and unit of issue. Cards should be numbered for easy reference, such as G503/400, indicating the 400th card of Group G503. A bulletin containing changes should be published periodically to keep the system up to date. Appropriate sets of cards should be automatically furnished newly activated companies and sets pertaining to new equipment should be available for requisition when new equipment must be supported. A form of stock card and system of handling must be developed which will serve the needs of field service. Such a system would eliminate many of the errors now inherent in the Ordnance supply system and would reduce training problems for supply clerks.

46. Machine Records. The status of materiel is as important to a unit commander as the status of personnel. Records were kept by out-dated manual methods although improved machine record methods were available for personnel accounting. Such methods are adaptable to accounting for major items of equipment, and may be refined to give data on maintenance, parts consumed and comparative economy of maintenance in various units.

47. Back Orders. "Dues Out" must be reviewed periodically to prevent pyramiding of requirements. Ordnance plans prepared at the theater level should contain provisions for periodic review of "Dues Out".

48. Local Procurement. A valuable means of augmenting Ordnance supply and of meeting deficiencies in addendum lists to the Ordnance catalog lies in the exploitation of local resources. Local procurement should be coordinated at the theater level, and requirements should be analyzed from the theater viewpoint and placed on an adequate basis to cover the entire theater requirements instead of becoming a piece-meal shopping service for a few troop units.

SECTION 2

RECOMMENDATIONS

49. Advance Shipments. It is recommended that supply build-up for an established theater of operations be based on a system of advance or pre-scheduled shipment of major items of equipment.

50. Theater Reserves. It is recommended that theater reserves of major items be established on a basis which would be sufficient to meet contingencies due to temporary high battle losses, to permit maintenance exchange, to meet unexpected demands, and to insure availability. It is further recommended that the initial theater reserves, where established, be calculated upon the number of requisitions to be maintained plus a factor which will insure against unexpected initial losses due

to type of operations and interruptions to shipping.

51. Theater Stocks of Spare Parts. It is recommended that initial theater stocks of spare parts be established on the basis of the first year's concurrent spares plus major overhaul and that the distribution factor be compensated for by shipping maintenance and tactical depot companies overseas with basic loads for common items most likely to be supported. It is recommended that theater requirements from the Zone of the Interior be sufficiently large to meet inter-allied commitments for war aid within the theater and inter-service transfers of equipment, and to provide for distribution.

52. Cleaning and Preserving Materials. It is recommended that tables of allowances be revised at frequent intervals to insure that current methods for care of weapons as announced in technical manuals are reflected therein. It is recommended that cleaning and preserving materials be packaged in water-proofed packages on the basis of sufficient supplies to properly care for the weapons of an infantry squad, tank, medium artillery or heavy artillery piece, for one week, and that daily distribution of these packages be made by Ordnance service to insure that each squad, tank or artillery crew receives at least one package per week.

53. Special Operational Needs. It is recommended that Ordnance major items and spare parts expected to be consumed at abnormal rates, because of a special operational need, be placed in Class IV and accorded special handling in order to avoid depleting current operating stocks and to obtain additional emphasis in increased procurement and supply.

54. Supply Administration. It is recommended that emphasis be placed upon the training of supply personnel, and the program of a uniform system of parts numbers be completed as expeditiously as possible. It is further recommended that pre-printed stock cards for each subgroup of the Ordnance catalog be prepared and issued to Ordnance companies upon activation or as new types of material become available. These cards should contain full information for stock purposes, including item stock number and interchangeability and should be kept current by means of a periodic information bulletin.

55. Machine Records. It is recommended that consideration be given to the use of the machine records system of personnel accounting with a view to establishing a similar system of accounting for material. Secondary missions for such a system are frequency of maintenance operations, parts consumed, and comparative economy of maintenance in various units.

56. Back-Orders. It is recommended that provisions for a periodic review of "Dues Out" be contained in Ordnance plans.

57. Local Procurement. It is recommended that plans for local procurement be prepared on a theater level for future operations to provide this service on a theater basis to meet the requirements of all troop units in lieu of a piece-meal shopping service for a few troop units, that this program be integrated into fifth echelon maintenance programs, long range procurement from the Zone of Interior, and that provisions be made to obtain additional needed critical materials from the Zone of Interior and other theaters to facilitate fullest exploitation.

58. Revision of Publications. It is recommended that pertinent field manuals, army regulations and technical manuals be amended by appropriate agencies of the War Department to incorporate the recommendations contained in this study.

MONTHLY REPLACEMENT FACTORS*

Item	War Department		Actual Loss (Average Monthly) 6 June 1944 to 20 May 1945	Recommended by First US Army Prior to D-Day
	1 June 1944	8 May 1945		
Gun, 57mm	7	6	3.3	8
Howitzer, 105mm, M2	3	3	2.1	6
Howitzer, 105mm, M3	3	6	3.4	
Howitzer, 155mm, (all types)	3	3	1.2	6
Gun, 155mm, M1	2	2	1.0	1.5
Light Tank	7	8	6.3	15
Medium Tank, w/75mm	7	14	8.9	20
Medium Tank, w/76mm	7	14	10.0	20
Carriage, mtr, 75mm How, M8	7	6	4.3	8
Carriage, mtr, 105mm How M7	7	5	2.5	12
Carriage, mtr, 3" gun, M10	7	7	7.5	16
Carriage, mtr, 76mm, M18	7	7	6.7	
Half-Tracks	7	4	2.9	5
Scout Cars	7	4	3.3	4
Multiple Gun Carriages (AA)	7	3	1.8	7
40mm AA Guns	2	1	0.7	4
90mm AA Guns	2	2	1.0	2
Truck, 1/4 ton	6.3	4	3.0	10
Truck, 3/4 ton	4.2	2	1.4	3.5
Truck, 2-1/2 ton dump	4.2	3	1.4	1.0
Truck, 2-1/2 ton cargo	4.2	3	2.2	4
Truck, 4 ton, 6x6, cargo	2.8	2	1.5	3
Truck, 4 ton, wrecker	2.8	2	0.9	3
Truck, 6 ton, prime mover	2.8	3	2.0	5
Trailer, 1/2 ton	2.8	3	1.7	5
Trailer, 1 ton	2.8	1	0.9	1.5

* Extracted from "Reports of Materials Consumed", Ordnance, ETOUSA, for 20 June 1944 and 20 May 1945.

EXTRACT OF MONTHLY STATISTICAL REPORTS

ORDNANCE SERVICE, COMMUNICATIONS ZONE, EUROPEAN THEATER

Period Covered: 6 June 1944 to 28 February 1945

Summary of Statistical reports showing the number of weeks, out of a total period of 39 weeks, in which various critical major items were below authorized T/E plus reserve levels.

<u>MAJOR ITEMS</u>	<u>WEEKS REPORTED SHORT</u>
<u>Combat Vehicles</u>	
Medium Tanks	39
Light Tanks	4
Armored Cars	39
Half Tracks	39
<u>Small Arms, Mortars, etc</u>	
Mortar, 60mm	26
Mortar, 81mm	17
Gun, Mach., Cal. .30, Flex.	12
Rifle, Auto., Cal. .30 (BAR)	3
Gun, Submachine, Cal. .45	12
Rifle, Cal. .30, M1	4
Launcher, Rocket, Anti-Tank	12
Binoculars, All Models	35
Compass	17
Watches, Pocket & Wrist	35
<u>General Purpose Vehicles</u>	
Trucks, 1½ ton & under	35
Trucks, 2½ ton & over	39
Trailers, ½ ton & 1 ton	12
<u>Artillery Weapons</u>	
Anti-Tank Motor Carriages	31
Field Artillery Motor Carriages	26
Anti-Aircraft Artillery, Multi Gun, Motor Carriages	17
Towed Medium Field Artillery	21
*Heavy Field Artillery	9

* - Extracted from G-4 Periodic Reports, 12 US Army Group.

The following is a copy of the Inter-Office Memo Slip, Headquarters, Fifteenth US Army, dated 19 May 1945, from Amrored Section, 15th US Army to Ordnance Section, 15th US Army, subject: "Statistics, Medium Tanks in Combat, Experience of First US Army".

1. Attached hereto are statistics based upon six and one-half (6½) months of experience with an average of over 1,100 medium tanks in combat. (First US Army experience)

2. It is interesting to note that due to a shortage in supply the Army authorization averaged 95.29% of T/E allowances. Also it will be noted that only an average of 88.85% of these tanks in the hands of using organizations were operational each day (any tank that was expected to be repaired within six (6) hours was reported as operational).

	Medium Tank T/E Strength	FUSA Authori- zation	Medium Tank Oper. live Daily Average	Medium Tanks Lost
AUGUST 1944 - TOTAL	1358	1358	1282	223
SEPT 1944 - TOTAL	1184	1138	1025	139
OCT 1944 - TOTAL	1454	1562	1201	132
NOV 1944 - TOTAL	1054	931	846	133
DEC 1944 - TOTAL	1730	1588	1320	398
JAN 1945 - TOTAL	1400	1368	1210	184
½ of FEB 1945 TOTAL	1064	1064	942	<u>122</u>
GRAND TOTAL LOSS FOR PERIOD AUGUST 1944 TO FEBRUARY 1945				<u>1251</u>

E X T R A C T

(Extracted from 12 US Army Group G-4 Periodic Report covering period from 240001 December 1944 to 302400 December 1944. Report dated 021200 January 1945.)

* * * * *

(d) Battle losses of critical major items due to recent enemy action:

	First Army <u>Thru 28 Dec.</u>	Third Army <u>Thru 28 Dec.</u>	Ninth Army <u>Thru 29 Dec.</u>
Launcher rocket M1A1 & M9A1	1379	906	84
Gun, machine, Cal. .30, M1917A1	374	63	9
Gun, machine, Cal. .30, M1919A4	300	86	6
Mortar, 60mm, M2, w/mount	326	194	20
Mortar, 81mm, M1 w/mount	168	60	1
Rifle, Brg, Auto, Cal. .30, M1918A2	675	419	59
Gun, 57mm, M1, w/carr, M1A2	156	47	0
Gun, 3", M5, w/carr, M1	81	34	0
Howitzer, 105mm, M2A1, w/carr, M2A2	32	26	1
Howitzer, 8", M1	0	9	0
Car, armcd, light, M8	94	27	0
Carriage, motor, 90mm, Gun, M36	13	7	0
Carriage, motor, M7	10	57	0
Tank, light, M5A1	60	35	2
Tank, medium, (75 and 76mm)	223	150	1
Truck, 1/4-ton, 4x4	1368	426	35
Truck, 2 1/2-ton, 6x6, cargo	580	231	22
Truck, 2 1/2-ton, 6x6, dump	98	31	0

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Statement of Lt. Col. M. L. Driscoll, Ordnance Supply Officer, Ordnance Service, SOS-ETO and Communications Zone, ETOUSA, from June 1942 to April 1945.

The system of advance or prescheduled shipments was adhered to except in the instance of eight inch gun and 240mm howitzer battalions. Due to an over-all shortage of equipment of these types, these units were convoy-loaded, their equipment accompanying them.

Waterproofing materials, including sheet metal, bar stock, welding rod, oxygen and acetylene, were procured from the British. Basis was 75% of all vehicles to be embarked, including 25,000 combat vehicles, plus 25% for training. Reciprocal aid of this sort was deducted from long range procurement from the Zone of Interior.